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JOURNAL OF

THE NEW ENGLAND BOTANICAL CLUB

Vol. 10. **May, 1908.** **No. 113.**

THE CRATAEGI OF THE NORTHEASTERN UNITED STATES AND ADJACENT CANADA.

W. W. EGGLESTON.

THE genus *Crataegus* presents an interesting problem, and one for the study of which we are just beginning to get sufficient data. Up to ten years ago the American species of this genus were much better known in European botanical gardens than at home; and one of the most vexing problems of the present in regard to the group is to know precisely what has been meant by the species described in Europe.

In preparing a treatment of the genus soon to be issued I have endeavored, first to give a clear characterization of the different sections, with good keys; second to take up the more important published species and varieties, without even pretending to deal with every form that may prove worthy of recognition. Much more thorough work needs to be done in the field, and careful cultural experiments will have to be made, before the genus can be exploited finally.

The part of northeastern North America that really needs the most exploration in connection with this genus is southern Virginia, east of the Blue Ridge. Here should be found a number of the *Flavae* and other southern forms. Profitable work, however, can still be done all over the northeastern states and in adjacent Canada, both in extending the known ranges of old species and in finding new forms.

In my judgment much of the trouble found in *Crataegus* arises from hybridization, and why may not mutation be another disturbing element? Along these lines there is a fine field for experimental work. Unhappily, such investigation in the case of *Crataegus* offers much greater difficulty than in *Viola* where the whole life history can be observed within a year or so. In *Crataegus* it would require perhaps eighteen months for the germination of the seed and from eight to ten years to secure mature fruit from the first generation. Thus one would need the equipment and backing of an arboretum to carry on such work on a scale sufficiently extended to secure definite results.

So far as known, the genus produces plenty of good seed, and the plantations at Biltmore, the Arnold Arboretum, and my own, at the New York Botanical Garden, have shown that the forms of the genus reproduce themselves surprisingly true from seed. Yet, further experiments are greatly to be desired, in which *all* the seed from a single tree are retained and raised to maturity. When this is tried, it will be surprising indeed if *Crataegus* differs from other members of the Rose Family, which are so notoriously susceptible to crossing.

The genus is so variable that it is impossible to find characters which will hold absolutely true, either between species or even sections; then again, characters which seem to hold good in one section are useless in the next. Thus in the *Molles* and *Coccineae* certain species have cordate leaves on their vegetative shoots, but in the *Tenuifoliae* and *Pruinosae* both cordate and wedge-shaped leaves occur on the same plant.

The best time to study *Crataegi* is when they are in mature fruit. Often it is impossible to name dried flowering material closer than to one of two groups, while mature fruiting material, even in the dried state, would easily settle the species. This case holds particularly true between the *Tenuifoliae* and *Pruinosae*, the *Coccineae* and *Molles*, the *Macracanthae* and *Anomalae*.

Personally I am fast losing confidence in the number of stamens as a reliable diagnostic character. It is true that in a general way the flowers of many species seem to have prevailingly 5–10 stamens or 10–20 stamens, but both 10-stamened and 20-stamened flowers sometimes are found on the same tree; and material is fast accumulating which seems to show that for every 10-stamened form somewhere a similar form will occur with 20 stamens, and the reverse.

In a general way color of anthers seems to be correlated with color of the immature foliage; thus yellow anthers go with yellow-green leaves, pink anthers with bronze-green leaves; and the different sections have their own particular color. For instance, the only constant difference between the *Coccineae* and the *Molles* is this color difference, all other distinctions breaking down at some point; but even this character must be employed with caution, particularly if there are hybrids in the genus, for plants are often encountered which have seemingly the wrong anther-color; thus *Pruinosae* and *Tenuifoliae*, which habitually have pink anthers, occasionally exhibit yellow anthers. In the North one would naturally investigate these as probable crosses with the *Rotundifoliae, Intricatae*, or *Molles*. The section *Macracanthae* is one of the most easily distinguished because the nutlets have pits on their inner faces, and naturally a hybrid between one of the *Macracanthae* and a species with plane nutlets would be marked. One would expect in such a form nutlets with pits of all degrees of depth, and forms of this sort are in fact often found in nature.

One of the best places to study *Crataegus* hybrids is in the Northwest, where there are only three groups represented, one with black fruit, the others with red. In this region forms with brown or chestnut-colored fruit are found, but they are relatively so scarce as to suggest hybrid origin.

Although anther-color seems to be of value in determining *Crataegi*, it is a distinction which cannot be used in the case of dried material, and even in the live plants it is of such short duration that I have left it out of my keys.

Reliable characters are to be found in the fruits, number of nutlets, sculpture of the nutlets, and consistency of the flesh, whether hard or soft at maturity, and form of the calyx, while even the leaves and sepals are of more permanent aid to us than the color character.

In sectional names the oldest known have been used. Fortunately only one section had to be renamed. For this I used the name of the oldest as well as the most characteristic species, as follows:

Rotundifoliae, n. nom. *Coccineae* Sarg. Man. Trees N. A. 366 (1905), not Loudon, Arb. et Frut. Brit. **2**: 816 (1838).

Other notes and nomenclatorial changes which it seems best to put on record together with synonymy and bibliography are as follows:

C. CRUS-GALLI L., var. **exigua** (Sarg.), n. comb. *C. exigua* Sarg. Rhod. **5**: 52 (1903).

C. CRUS-GALLI L., var. PRUNIFOLIA (Poir.) Loud. Arb. et Frut. Brit. **2**: 821 (1838). *Mespilus prunifolia* Poiret, Encyc. Method. **4**: 443 (1797) and in Nouveau Duhamel Traité des Arbres et Arbust. **4**: 150, t. 40 (1809). *C. attenuata* Ashe, Jour. Elisha Mitchell Soc. **19**: pt. 1, 30 (1903). This variety seems to have been subject to a mistaken interpretation, which needs revision. Poiret's description and plate call for a glabrous form of *C. Crus-galli* with rather broad and somewhat acute-pointed leaves. The form occurring at Port Huron, Mich., and Windsor, Ontario (*C. attenuata* Ashe) exactly fits this plate. It is to be noted that *M. prunifolia* Poiret originally came from Canada. Furthermore as *C. Crus-galli* is an extremely rare form in Canada, this southern Ontario region being the only place where it is known to occur native, the evidence seems very clear that this particular form is the original of var. *prunifolia*. Unfortunately the name *prunifolia* after Poiret's time was transferred both in botanical gardens and in literature to a broad-leaved form of *C. Crus-galli* with pubescent leaves and corymbs (see for instance DeCandolle, Torrey and Gray, etc.).

C. Crus-galli × macracantha, n. hybr. Certain broad-leaved individuals with foliage as in *C. Crus-galli,* var. *prunifolia,* the corymbs pubescent, the calyx-lobes serrate, the nutlets 2–3, their pits varying from shallow to deep, have all the appearance of being natural hybrids between these two species. (*C. persimilis* Sarg.; *C. prunifolia* of European gardens, in part.) — Occasional.

C. BERBERIFOLIA T. & G., var. **Engelmanni** (Sarg.), n. comb. *C. Engelmanni* Sarg. Bot. Gaz. **31**: 2 (1901).

C. COLLINA Chapm., var. **sordida** (Sarg.), n. comb. *C. sordida* Sarg. Bot. Gaz. **33**: 114 (1902).

C. COLLINA Chapm., var. **Lettermani** (Sarg.), n. comb. *C. Lettermani* Sarg. Bot. Gaz. **31**: 220 (1901).

C. APPOSITA Sarg., var. **Bissellii** (Sarg.), n. comb. *C. Bissellii* Sarg. Rhod. **5**: 65 (1903).

The name C. COCCINEA has been applied to many different plants both by Linnaeus himself and by later authors. Linnaeus, Sp. Pl. ed I, **1**: 476 (1753), thus describes *C. coccinea*: —

> "CRATAEGUS foliis ovatis repando angulatis serratis glabris. *Hort. cliff.* 187 [1737]. *Hort. Ups.* 126 [1748]. *Gron. virg.* 54 [1739]. *Roy. lugdb.* 272 [1740].
>
> Mespilus, apii folio virginiana spinis horrida, fructu amplo coccineo. *Pluk. Alm.* 249. *t.* 46. *f.* 4 [1691].
>
> Mespilus spinosa s. Oxyacantha virginiana maxima. *Angl. hort.* [Catalogus plantarum....quae in hortis non procul a Londino propagantur] 49. *t.* 13. *f.* 1 [1730].
>
> *Habitat in* Virginia, Canada.
>
> *Variat cum validis spinis lateralibus & absque spinis.*"

Here the first three paragraphs undoubtedly refer to three distinct species, belonging to three sections of the genus. The plant of the first paragraph is represented in the British Museum by a small fragment of Plukenet's labeled as of t. 46, f. 4, and supposed to have come from Virginia. This Plukenet specimen is so incomplete that it is impossible to determine the species to which it belongs. See Sarg. Bot. Gaz. **31**: 12 (1901). My photograph of this type seems clearly to represent a form of the group *Coccineae* Loud. For further confirmation of this view, see Miller, Dict. ed. I, no. 8 (1731), ed. VII, nos. 7 and 8 (1759), ed. VIII, no. 4 (1768); Aiton, Hort. Kew. ed. I, **2**: 167 (1789); Watson, Dendr. Brit. **1**: t. 62 (1825); Hook. Bot. Mag. t. 3432 (1835); Loud. Arb. et Frut. Brit. **2**: 816 (1838); and T. & G. Fl. N. A. **1**: 465 (1840).

Plate 3432 in the Botanical Magazine represents a flowering specimen with pink anthers and ten stamens, which must have been very near either *C. pedicillata* or *C. polita* Sarg. This seems good evidence for *C. coccinea* Mill. and for the section *Coccineae* Loud. But the Plukenet type is so incomplete as to be undeterminable and might easily belong in the section *Molles* as Prof. Sargent (Bot. Gaz. **31**: 12, 1901) thinks, and therefore this vague element in the composite should be ignored if there is another covered by the Linnaean description which we can determine. Happily this is the case and it is possible to identify both the other elements included by Linnaeus under the composite *C. coccinea* of the first edition of his Species Plantarum. The second plate cited by Linnaeus, namely, a fine colored one in Angl. Hort. 49, t. 13, f. 1 (1730), is unmistakably *C. Phaenopyrum* (L. f.) Medic. This species, under any rule can be eliminated from the question if we can determine the species represented by the first plate. This first plate, Pluk. Alm. 249, t. 46, f. 4, has been variously interpreted. It was, without much doubt, drawn from material collected by Banister in Virginia (Chesapeake Bay region). These Banister-Plukenet types are preserved in the British Museum, as is also the later material collected by Clayton in Virginia. Mr. James Britten kindly sent me photographs of these *Crataegus* types, but the one supposed to be the original of t. 46, f. 4 I saw at once could not have been used to make this plate. Mr. Britten made another search and found an unnumbered specimen of Plukenet's that he says does exactly match the plate. This is fortunately in mature fruit. Mr. Britten was so kind as to send me one of the fruits and this at once decided the question. It is a red-brown pubescent fruit with firm flesh, and, when the type of leaves is considered, can represent no other American thorn than *C. modesta* Sarg. These facts, together with the circumstance that the form in question is one of the few known from the Chesapeake Bay region ought to settle the status of *C. coccinea* L.

This species seems to have been rarely collected by the early American botanists. It is represented in the Torrey herbarium (N. Y. Bot. Gard.) by a specimen from West Point, N. Y. (1825), in regard to which Dr. Gray recorded the opinion that this was exactly the *C. glandulosa* of Pursh as seen in the Barton herbarium.

The following synonyms appear to belong to this species: — *C. coccinea*, var. *viridis* T. & G. Fl. N. A. **1**: 465 (1840), in part. *C. intricata* J. Lange, Bot. Tidssk. **19**: 264 (1895). *C. modesta* Sarg. Rhod. **3**: 28 (1901). *C. premora* Ashe, Ann. Car. Mus. **1**: 391 (1902).

The history of *C. coccinea* is rendered still more complex by the fact that Linnaeus in subsequent publications included in his species still other elements. Thus in the second edition of the Species Plantarum (1762) he added the description and cited the plate of Miller's *Mespilus cordata*. Finally in the Mantissa altera, 397 (1771) he gives a description which points to still a fifth species and group, namely to the plant here called *C. rotundifolia*, var. *Faxoni*. This last is the form taken up by Prof. Sargent for *C. coccinea* (Bot. Gaz. **31**: 12, 1901).

It would take a small volume to discuss critically the forms taken up by authors since the time of Linnaeus for *C. coccinea*. Indeed the species has been made a sort of general dumping ground for unknown forms.

C. TOMENTOSA L. *C. uniflora* Muench. Hausv. **5**: 147 (1770). *C. parvifolia* Ait. Hort. Kew. ed. I, **2**: 169 (1789). *C. tomentosa* is another badly interpreted species. It also came from the Chesapeake Bay region (*Banister*) and as published by Linnaeus is a composite. The first paragraph relating to the species in L. Sp. Pl. ed. I, **1**: 476 (1753) "Craetaegus foliis cuneiformi-ovatis serratis subangulatis subtus villosis, ramis spinosis. Habitat in Virginia" can refer to but one plant of this region; while the expression "ramis spinosis" will not fit the form *C. tomentosa* T. & G., and this form does not occur in the Chesapeake Bay region. In Sp. Pl. ed. II, **1**: 682 (1762), Linnaeus adds "Mespilus virginiana, grossulariae foliis. Pluk. phyt.

100. f. 1." Of this plate Plukenet, Alm. 249 (1696) says: "Mespilus Virginiana grossulariae foliis, fructu rubro minore, Phytogr. Tab. 100. f. 1. an Oxyacanthus folio parvo subrotundo, flore unico, theca foliacea incluso summitatibus ramulorum insidente *Banisteri*." This unmistakably places the species, as there is only this one-flowered species in the region. See also Miller's Dict. ed. VIII (1768) under *C. tomentosa* L., as also Michaux, etc., for further confirmation of our views.

C. TOMENTOSA L., var. **Smithii** (Sarg.), n. comb. *C. Smithii* Sarg. Trees and Shrubs, **1**: 67, t. 34 (1903).

C. COLUMBIANA Howell, var. **Piperi** (Britton), n. comb. *C. Piperi* Britton, Torreya, **1**: 55 (1901).

C. COLUMBIANA Howell, var. **Brunetiana** (Sarg.), n. comb. *C. Brunetiana* Sarg. Rhod. **5**: 64 (1903).

C. IRRASA Sarg., var. **Blanchardi** (Sarg.), n. comb. *C. Blanchardi* Sarg. Rhod. **7**: 218 (1905).

C. ROTUNDIFOLIA Moench, var. **Bicknellii**, n. var. foliis ad apicem modice acute lobatis; corymbis paullo villosis mox glabris; calycis lobis longis laciniatis persistentibus ad maturitatem fructus; nucellis saepissime 4–5.— Leaves somewhat sharply lobed towards the apex; corymbs slightly villous, soon glabrous; calyx-lobes long, laciniate, persistent on the fruit; nutlets usually 4–5.— Nantucket, Mass.: Wauwinet, June 5, 1900 (in flower), *Miss Mary A. Day*, no. 76; Polpis, September 5, 1904, *E. P. Bicknell* (type, in Herbarium of the New York Botanical Garden); also Quaise, September 19, 1907, *E. P. Bicknell*. Mr. Bicknell says "this is a round-topped shrubby tree, sometimes 3 m. high, of which I know only a few individuals."

The only other native thorn that I have seen from Nantucket is a specimen of the *Intricatae* (in leaf only), collected by Mr. Bicknell. This is likely to be *C. apposita* Sarg.

C. ROTUNDIFOLIA Moench, var. **Faxoni** (Sarg.), n. comb. *C. Faxoni* Sarg. Rhod. **5**: 161 (1903). *C. coccinea* of the Linnaean Herbarium in part. See Sarg. Bot. Gaz. **31**: 12 (1901); L. Sp. Pl. ed. III, **1**: 682 (1764).

C. ROTUNDIFOLIA Moench, var. **chrysocarpa** (Ashe), n. comb. *C. chrysocarpa* Ashe, Bull. N. Car. Agric. Coll. **175**: 110 (1900).

C. Marshallii, n. nom. *Mespilus apiifolia* Marsh. Arb. 89 (1785). *C. apiifolia* Michx. Fl. **1**: 287 (1803), not Medic. Gesch. 83 (1793).

C. LUCORUM Sarg., var. **insolens** (Sarg.), n. comb. *C. insolens* Sarg. Rhod. **7**: 217 (1905).

C. MACROSPERMA Ashe, var. **pentandra** (Sarg.), n. comb. *C. pentandra* Sarg. Rhod. **3**: 25 (1901).

C. MACROSPERMA Ashe, var. **demissa** (Sarg.), n. comb. *C. demissa* Sarg. Rhod. **5**: 139 (1903).

C. MACROSPERMA Ashe, var. **pastorum** (Sarg.), n. comb. *C. pastorum* Sarg. Rhod. **3**: 24 (1901).

C. MACROSPERMA Ashe, var. **matura** (Sarg.), n. comb. *C. matura* Sarg. Rhod. **3**: 24 (1901).

C. MACROSPERMA Ashe, var. **acutiloba** (Sarg.), n. comb. *C. acutiloba* Sarg. Rhod. **3**: 23 (1901).

C. Grayana, n. sp., foliis flabellatis 3–8 cm. longis 2–7 cm. latis basi cuneatis vel truncatis apice acuminatis simplice vel duplice serratis, dentibus parvis rectis, lobis 4–5-jugis acuminatis saepe recurvatis; foliis junioribus supra et subtus in veniis paullo appresse pubescentibus mox glabratis membranaceis supra obscure viridibus subtus pallidioribus; petiolis gracilibus 1.5–3 cm. longis glabris; corymbis multifloris paullo villosis, floribus 1.5–1.8 cm. latis; tubo calycis subtus villoso supra glabro, lobis lanceolatis acuminatis circa 5 mm. longis glabris integris vel remote glandularibus; staminibus circa 20, antheris roseis; stylis 3–5 basi tomento pallido circumdatis; fructu subgloboso vel breviter ellipsoidali angulari 10–15 mm. crasso atrorubenti paullo villoso sed glabrato; pericarpio crasso farinaceo flavo; sepalis patentibus persistentibus; nucellis plerisque 4–5, dorso carinatis, 6–7.5 mm. longis, fasciculo nucellarum 6–8 mm. crasso.— Leaves flabellate, 3–8 cm. long, 2–7 cm. wide, cuneate to truncate at the base, acuminate at the apex, simply or doubly serrate with fine straight teeth, with 4–5 pairs of acuminate often recurved lobes; young leaves with a straight appressed pubescence above and along the veins beneath, becoming glabrous, membranaceous, dull green above, paler beneath; petioles slender, 1.5–3 cm. long, glabrous; corymbs many-flowered, somewhat villous; flowers 1.5–1.8 cm. wide; calyx-tube villous below, glabrous above; calyx-lobes lanceolate, acuminate, about 5 mm. long, glabrous, entire or remotely glandular; stamens about 20; anthers pink; styles 3–5, surrounded at the base by pale tomentum; fruit subglobose to short-ellipsoidal, angular, 10–15 mm. thick, dark crimson, slightly villous, becoming glabrous; sepals spreading, persistent; flesh thick, mealy, yellow; nutlets usually 4–5, ridged on the back, 6–7.5 mm. long, nest of nutlets 6–8 mm. thick.— Round-topped shrubs or small trees, sometimes 6 m. high, armed with chestnut-brown curved thorns 2–5 cm. long; vegetative twigs chestnut-brown, glabrous.— Montmorency Falls to Montreal, Que., western New England, and northeastern New York. Type no. 2762 *Eggleston*, Caughnawaga Reservation, Quebec, May 28, Sept. 25, 1902 (in hb. Gray).

Of this species I have examined the following specimens: — PROVINCE OF QUEBEC: Montmorency Falls, May 30, Sept. 23, 1901, *J. G. Jack,* nos. 128, 131 (hb. Arn. Arb.); Longueil, May 27, Sept. 25, 1902, *J. G. Jack,* no. 138 (hb. Arn. Arb.); Mount Royal, Oct. 6, 1903, *Eggleston,* no. 3339 (hb. N. Y. Bot. Gard., hb. Egg.); La Tortue, May 30, Oct. 4, 1900, *W. A. Jack,* no. 68 (hb. Arn. Arb.); Highlands (Island of Montreal), May 30, Sept. 21, 1901, Sept. 26, 1902, *J. G. Jack,* no. 134 (hb. Arn. Arb.); Caughnawaga, May 30, Sept. 24, 1900, *J. G. Jack,* nos. 83, 84 (hb. Arn. Arb.); May 28, Sept. 25, 1902, *Eggleston,* no. 2762 (hb. Gray, hb. N. Y. Bot. Gard., hb. Egg.); Chateaugay, May 31, Sept. 25, 1900, *J. G. Jack,* no. 871 (hb. Arn. Arb); Phillipsburg, July 25, 1901, *E. Brainerd,* no. 28 (hb. Arn. Arb., hb. Egg.). NEW YORK: Crown Point, June 4, Sept. 21, 1902, *Eggleston,* nos. 2703, 3154 (hb. Arn. Arb., hb. Egg.); Sept. 12, 1903, *C. H. Peck,* no. 4 (hb. Arn. Arb.). NEW HAMPSHIRE: North Walpole, May 17, Oct. 4, 1903, *Eggleston,* no. 2923 (hb. Arn. Arb., hb. Egg.). VERMONT: Mr. W. H. Blanchard has collected material in Bellows Falls, which he has referred to this species, but I have not seen it. MASSACHUSETTS: Southborough, May 17, Sept. 4, 1904, *C. S. Sargent,* no. 4 (hb. Arn. Arb.). CONNECTICUT: Giant's Neck, East Lyme, May 3, Aug. 19, Sept. 5, 16, 1904, *C. B. Graves,* no. 70 (hb. Arn. Arb.).

C. PRUINOSA (Wendl.) C. Koch, var. **latisepala** (Ashe), n. comb. *C. latisepala* Ashe, Bull. N. Car. Agric. Coll. **175**: 109 (1900).

C. PRUINOSA (Wendl.) C. Koch, var. **philadelphica** (Sarg.), n. comb. *C. philadelphica* Sarg. Proc. Acad. Sci. Philad. **57**: 588 (Sept. 1905).

C. PRUINOSA (Wendl.) C. Koch, var. **conjuncta** (Sarg.), n. comb. *C. conjuncta* Sarg. Rhod. **5**: 57 (1903).

C. PRUINOSA (Wendl.) C. Koch, var. **Porteri** (Britton), n. comb. *C. Porteri* Britton, Bull. N. Y. Bot. Gard. **1**: 448 (1900).

C. PRUINOSA (Wendl.) C. Koch, forma **dissona** (Sarg.), n. comb. *C. dissona* Sarg. Rhod. **5**: 60 (1903).

C. SILVICOLA Beadle, var. **Beckwithae** (Sarg.), n. comb. *C. Beckwithae* Sarg. Proc. Roch. Acad. Sci. **4**: 124 (1903).

C. BEATA Sarg., var. **compta** (Sarg.), n. comb. *C. compta* Sarg. Proc. Roch. Acad. Sci. **4**: 102 (1903).

C. LEIOPHYLLA Sarg., var. **Maineana** (Sarg.), n. comb. *C. Maineana* Sarg. Proc. Roch. Acad. Sci. **4**: 106 (1903).

C. COCCINIOIDES Ashe, var. **dilatata** (Sarg.), n. comb. *C. dilatata* Sarg. Bot. Gaz. **31**: 9 (1901).

C. Pringlei Sarg., var. **exclusa** (Sarg.), n. comb. *C. exclusa* Sarg. Rhod. **5**: 108 (1903).

C. Pringlei Sarg., var. **lobulata** (Sarg.), n. comb. *C. lobulata* Sarg. Rhod. **3**: 22 (1901).

C. pedicillata Sarg., var. **Ellwangeriana** (Sarg.), n. comb. *C. Ellwangeriana* Sarg. Bot. Gaz. **33**: 118 (1902).

C. polita Sarg., var. **Tatnalliana** (Sarg.), n. comb. *C. Tatnalliana* Sarg. Bot. Gaz. **35**: 106 (1903).

C. mollis (T. & G.) Scheele, var. **sera** (Sarg.), n. comb. *C. sera* Sarg. Bot. Gaz. **33**: 115 (1902).

C. Phaenopyrum (L. f.) Medic. Gesch. der Bot. 83 (1793). *Mespilus Phaenopyrum* L. f. Suppl. 254 (1781). *Crataegus cordata* Ait. Hort. Kew. ed. I, **2**: 168 (1789); not *M. cordata* Mill. Dict. ed. VIII, no. 4 (1769) and in Fig. of Plants, 119, t. 179 (1760). This fine species was one of the first American thorns raised in Great Britain, being listed and illustrated by a fine colored plate (t. 13, f. 1) in the Catalogus plantarum . . . quae in hortis non procul a Londino propagantur (1730). Philip Miller, who was one of the gardeners who prepared this catalogue and was doubtless familiar with this species, tells us in regard to his *Mespilus cordata* of later date, that it was raised in the Chelsea Garden (where he was gardener) in 1738 from seeds which came from America. Furthermore neither his description nor his excellent colored plate of this later species corresponds to *C. Phaenopyrum*, but rather to some form of the *Tenuifoliae*, apparently nearest to *C. macrosperma* Ashe.

C. Brainerdi Sarg., var. **scabrida** (Sarg.), n. comb. *C. scabrida* Sarg. Rhod. **3**: 29 (1901).

C. Brainerdi Sarg., var. **Egglestoni** (Sarg.) Robinson in herb., n. comb. *C. Egglestoni* Sarg. Rhod. **3**: 30 (1901).

C. Brainerdi Sarg., var. **asperifolia** (Sarg.), n. comb. *C. asperifolia* Sarg. Rhod. **3**: 31 (1901).

C. macracantha Lodd., var. **rhombifolia** (Sarg.), n. comb. *C. rhombifolia* Sarg. Rhod. **5**: 183 (1903).

C. macracantha Lodd., var. **occidentalis** (Britton), n. comb. *C. occidentalis* Britton, Bull. N. Y. Bot. Gard. **1**: 448 (1900). *C. Colorado* Ashe, Bull. N. C. Exper. Sta. **175**: 110 (1900). *C. coloradensis* Nelson, Proc. Biol. Soc. Wash. **17**: 175 (1904).

C. macracantha Lodd., var. **succulenta** (Schrad.), n. comb. *C. succulenta* Schrad. ex Link, Handb. **2**: 78 (1831).

C. MACRACANTHA Lodd., var. **neofluvialis** (Ashe), n. comb. *C. neo-fluvialis* Ashe, Jour. Elisha Mitchell Soc. **16**: pt. 2, 71 (1900).

C. CHAPMANI (Beadle) Ashe, var. **Plukenetii,** n. var. *C. tomentosa* of the Linnaean herbarium and of authors, but not of the Linnaean description. *C. leucophleos* Moench, Verz. Ausl. Baeume, 31 (1785)? This thorn was one of the first raised in Great Britain, as is shown by its inclusion in such early works as the above mentioned Catalogus plantarum....quae in hortis non procul a Londino propagantur t. 13, f. 2 (1730) and in Plukenet's Phyt. t. 46, f. 1 (1691).

Of the other two Linnaean species there can be no question, for *C. Crus-galli* L. rests on Kalm's description and is also represented in the British Museum by Clayton's specimen; while *C. viridis* L. is represented in the British Museum by Clayton's specimen (type), though I know of no other specimen of *C. viridis* L. from Virginia. However, there is a specimen of *C. viridis* L. in the U. S. Nat. Herb. (no. 130624) from Chesapeake City, Maryland, *L. F. Ward.* This Ward specimen I referred to *C. Margaretta* Ashe in Torreya **7**: 154 (1907); but a careful study of flowering material for a key has shown my mistaken identification. *C. Margaretta* has two or sometimes three styles, crenately lobed leaves, and numerous spines, while *C. viridis* has four or five styles, acutely lobed leaves, and very few or no spines. *C. viridis*, in flower, is much harder to distinguish from a form of *C. Canbyi* Sarg., namely the one called *C. Pennypackeri* Sarg.; the latter differing from *C. viridis* most obviously in its abundant thorns; and there is a possibility that this Ward specimen is *C. Pennypackeri* without thorns. Our Washington and Baltimore botanists have an excellent opportunity both to investigate this Chesapeake City region, and also Clayton's region about "Windsor" on the Plankatank, for the type location of *C. viridis* L.

Much of my study of the genus *Crataegus* has been done in the herbarium of the New York Botanical Garden, where for some months I have been engaged in bringing together as complete a representation as possible of the group. I have also been greatly aided by facilities afforded me at the Gray Herbarium, and I owe much to the privilege of examining the excellent herbarium and live collections of the Arnold Arboretum. I am further indebted to the Missouri Botanical Garden for the loan of over three thousand sheets of the genus, to the United States National Museum, to the Philadelphia Academy, to Prof. Aven Nelson, to President Ezra Brainerd for the loan of much additional material, and to a great many botanical friends who have sent me specimens of interest. Mr. C. D. Beadle gave me the privileges of the Biltmore Herbarium and very kindly aided me in the examination of the southern species. Mr. W. W. Ashe most kindly made a three days' trip to allow me to see his *Crataegus* herbarium. I have also to thank Dr. Marshall A. Howe for numerous translations of the descriptions of the older species.

New York Botanical Garden.

NOTES ON SOME PLANTS OF NORTHEASTERN AMERICA.

(*Continued from page 55.*)

M. L. Fernald.

Dentaria laciniata Muhl., var **integra** (Schulz), n. comb. *Cardamine laciniata* (Muhl.) Wood, var. *integra* Schulz in Engler's Bot. Jahrb. xxxii. 349 (1903).— A rather local extreme, having the leaves strictly ternate; the lateral leaflets entire or slightly toothed, but not cleft. Known only from western New York to Illinois.

Gaylussacia baccata (Wang.) C. Koch, forma leucocarpa (Porter) Fernald, Rhodora, x. 53 (1908). My attention has been called by several friends to a clerical error by which, in the original publication of this combination, I credited Wangenheim instead of C. Koch with the publication of *G. baccata*. *G. baccata* (Wang.) C. Koch, Dendrol. ii. pt. 1, 93 (1872) was based upon *Andromeda baccata* Wang., Beitr. Holzger. iii. t. 30, fig. 69 (1787).

Teucrium canadense L., var. **littorale**(Bicknell), n. comb. *T. littorale* Bicknell, Bull. Torr. Bot. Cl. xxviii. 169 (1901).— A lower stiffer and usually more simple plant than the inland *T. canadense*, but clearly passing to it in rich soil. In their most extreme developments the two plants are easily distinguished; the var. *littorale* of coastal beaches having the upper surface of the leaves papillose-roughened beneath the fine appressed pubescence, while the plant of less exposed situations is, as we should expect, thinner-leaved and with less developed papillae.

TEUCRIUM OCCIDENTALE Gray, var. **boreale** (Bicknell), n. comb. *T. boreale* Bicknell, Bull. Torr. Bot. Cl. xxviii. 171 (1901).— The first specimens cited by Dr. Gray under his *T. occidentale*, the Nebraska plants of *Hayden*, "etc." [*H. Engelmann*], have abundant short capitate or stipitate glands amongst the longer somewhat viscid hairs, and represent a species which extends across the continent from Maine to British Columbia and California. An extreme phase of the plant with few or no capitate glands amongst the long hairs of the calyx has a similar range and does not seem specifically separable from *T. occidentale*. This is the plant described by Mr. Bicknell as *T. boreale*. It has been mistaken by Piper, in his Flora of Washington[1] for the true *T. occidentale*, while the typical viscid *T. occidentale* is described by him as a new subspecies *viscidum* Piper, Contrib. U. S. Nat. Herb. xi. 487 (1906).

STACHYS TENUIFOLIA Willd., var. **aspera** (Michx.), n. comb. *S. aspera* Michx. Fl. ii. 5 (1803).— The familiar specific name, *S. aspera*, unfortunately, is antedated by *S. tenuifolia* Willd. Sp. iii. 100 (1801), which must be taken up for the species. *S. tenuifolia* is the smoother phase of the plant, which has been passing as *S. aspera*, var. *glabra* Gray, Syn. Fl. ii. pt. 1, 387 (1878).

STACHYS PALUSTRIS L., var. **homotricha**, n. var., caule retrorso-hirsuto, pilis longis subuniformibus.— Sides and angles of the stems almost uniformly hirsute with long retrorse hairs; otherwise like the typical form.— A frequent plant from eastern New Brunswick to Connecticut and central New York, thence westward to the Pacific. Type collected by the writer on a sandy esker at Brownville, MAINE, September 20, 1900. In typical *S. palustris* the angles of the stem are hirsute with spreading or reflexed hairs, but the sides of the stem are finely appressed-pubescent.

SATUREJA **glabra** (Nutt.), n. comb. *Hedeoma glabra* Nutt. Gen. i. 16 (1818). *H. arkansana* Nutt. Trans. Am. Phil. Soc., n. s., v. 186 (1834). *Calamintha Nuttallii* Benth. in DC. Prodr. xii. 230 (1848). *Calamintha glabella*, var. *Nuttallii* Gray, Man. ed. 2, 307 (1856). *Clinopodium glabrum* Ktze., Rev. Gen. 515 (1891). *Satureja arkansana* Briq. in Engl. & Prantl, Pflanzenf. iv. Ab. 3, 302 (1896).— The writer follows Briquet in considering *Calamintha* Lam. inseparable generically from the older *Satureja* L.

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[1] Contrib. U. S. Nat. Herb. xi. (1906).

PYCNANTHEMUM **pycnanthemoides** (Leavenw.), n. comb. *Tullia pycnanthemoides* Leavenw., Am. Jour. Sci. xx. 343, pl. 5 (1831). *Pycnanthemum Tullia* Benth. Lab. Gen. et Sp. 328 (1834). *Koellia pycnanthemodes* Ktze. Rev. Gen. ii. 520 (1891).— By vote of the Vienna Congress the long established name *Pycnanthemum* Michx. (1803) is retained for this genus instead of the earlier but long overlooked *Koellia* Moench (1794).

MENTHA ARVENSIS L., var. **glabrata** (Benth.), n. comb. *M. canadensis*, var. *glabrata* Benth. Lab. Gen. et Sp. 181 (1833). *M. arvensis*, var. *Penardi* Briq. Bull. Herb. Boiss. iii. 215 (1895).— As already indicated by Briquet, *Mentha arvensis* L. and *M. canadensis* L. are confluent, and the latter American extreme is treated as a narrow-leaved variety of the more broadly distributed *M. arvensis*. The var. *glabrata*, common across Canada, and locally southward into New England and Pennsylvania, and along the Rocky Mts., is generally well marked by its less branched smoother stem and smoother leaves, but it clearly intergrades with the other varieties of the species.

GERARDIA PEDICULARIA L., var. **ambigens,** n. var., caule supra glanduloso-villoso; pedicellis calycibusque plerumque villosis.— Stem glandular-villous above; pedicels and calyx usually villous.— Wisconsin to North Carolina and Missouri. Type collected at St. Croix Falls, WISCONSIN, August 20, 1900 (*C. F. Baker*). Transitional between the typical *G. pedicularia*, with the stems puberulent above, and the more southern var. *pectinata* Nutt. Gen. ii. 48 (1818), which has the stems very villous and the calyx glandular-hispid.

VIBURNUM LENTAGO L., var. **sphaerocarpum** Gray, n. var. in herb., drupis sphaeroideis 7–9 mm. diametro.— Drupes spherical, 7–9 mm. in diameter.— The original specimens thus labeled by Dr. Gray were collected in NORTH DAKOTA, at Fort Abraham Lincoln, by *Dr. V. Havard*; but other material has accumulated which shows this small- and globose-fruited extreme to occur from New England to Wyoming.

EUPATORIUM PURPUREUM L., var. **foliosum**, n. var., inflorescentia late corymbosa foliis bracteisque breviore.— Inflorescence broadly corymbose as in var. *maculatum*, but overtopped by the very long upper leaves and bracts.— The characteristic form of the species from western Newfoundland and the Gaspé Peninsula to northern Maine, extending westward to northern Michigan and Iowa. Type collected by the writer in a river-thicket at Van Buren, MAINE, September 18, 1900.

EUPATORIUM URTICAEFOLIUM Reichard, var. **villicaule**, n. var., caule petiolisque sordido-villosis.— Stem and petioles sordid-villous; otherwise as in the typical form.— VIRGINIA, Bedford Co., 1871 (*A. H. Curtiss*).

SOLIDAGO PETIOLARIS Ait., var. **Wardii** (Britton), n. comb. *S. Wardii* Britton, Man. 935 (1901). — Differing from *S. petiolaris* only in the firmer more glutinous and therefore more lustrous foliage.

SOLIDAGO HISPIDA Muhl., var. **lanata** (Hook.), n. comb. *S. lanata* Hook. Fl. Bor.-Am. ii. 4 (1834). *S. bicolor*, var. *lanata* Gray, Proc. Am. Acad. xvii. 190 (1882).— Plants from the banks of the Little Cascapedia and Grand Cascapedia Rivers, and other portions of the Gaspé Peninsula, Quebec, are identical with the original material collected by Drummond on the Plains of the Saskatchewan.

SOLIDAGO **calcicola** (Fernald), n. comb. *S. Virgaurea*, var. *calcicola* Fernald, RHODORA, i. 190 (1899).— Recent detailed studies of types and authentic specimens of this group have convinced the writer that we have in eastern America no plant which can satisfactorily be placed with the Eurasian *S. Virgaurea*. The nearest American ally of that species, as understood by the writer, is *S. macrophylla* Pursh, which, however, is distinct in its longer involucre, etc. *S. calcicola* also simulates forms of *S. Virgaurea* but is quickly distinguished by its firmer more herbaceous bracts and much shorter achenes (only 1–2 mm. long). Its range is now extended from the northeastern border of Maine to the limestone mountains of Gaspé Co., Quebec.

SOLIDAGO **Cutleri**, n. nom. *S. Virgaurea*, var. *alpina* Bigelow, Fl. Bost. ed. 2, 307 (1824). *S. alpestris* Porter, Bull. Torr. Bot. Cl. xx. 210 (1893) and other Am. authors, not Waldst. & Kit. in Willd. Sp. iii. 2065 (1804).— The late Dr. Porter considered this plant identical with the Old World *S. alpestris*; but that species as shown by many European specimens, as well as Waldstein & Kitaibel's own beautiful plate (Ic. t. 208), is very unlike the alpine plant of Bigelow. In fact, it is superficially very similar to the dwarfed alpine variety *thyrsoidea*[1] of *S. macrophylla*, having thinnish leaves with the closely sharp-serrate elliptic or ovate blades rather abruptly narrowed to the slender petiole; and its involucral bracts are thin and linear-attenuate. *S. Cutleri*,[2] on the other hand, has the thick obovate to oblanceolate leaves crenate or serrate chiefly above the middle and tapering gradually to a broad-winged base; and its subherbaceous obtuse or merely acutish bracts are oblong or lanceolate. From other American plants of the *Virgaurea* group, *S. Cutleri* is quickly distinguished by its 30–50-flowered broad heads, its few (2–4, rarely 5) large cauline leaves, and its long (3–3.5 mm.) hirsute achenes. It is confined apparently to the most alpine districts of New England and New York, being known to the writer only from the following mountains. MAINE, Mt. Katahdin; Mt. Bigelow, altitude 1150 m.: NEW HAMPSHIRE, alpine regions of Mts. Adams, Washington, and Monroe; summit of Mt. Lafayette: VERMONT, Chin of Mt. Mansfield: NEW YORK, summit of Mt. Whiteface.— Reported from other high summits, but from none of the lesser mountains.

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[1] RHODORA, viii. 228 (1906).

[2] Since the name *Solidago alpina* has been twice used and there is already a *S. Bigelovii*, it is appropriate that our alpine Goldenrod should bear the name of the distinguished New England botanist and pioneer explorer of the White Mountains, MANASSEH CUTLER.

SOLIDAGO RANDII (Porter) Britton, var. **monticola** (Porter), n. comb. *S. puberula*, var. *monticola* Porter, Bull. Torr. Bot. Cl. xix. 129 (1892). *S. Virgaurea*, var. *monticola* Porter, Bull. Torr. Bot. Cl. xx. 209 (1893). *S. Virgaurea*, var. *Deanei* Porter, Mem. Torr. Bot. Cl. v. 320 (1894).— *S. Randii* includes a large portion of the material which has passed with us as *S. Virgaurea*. In very exposed situations it passes to the dwarf extreme which has been separated as var. *monticola*, and which is often mistaken needlessly for *S. Cutleri*. In *S. Randii* and its variety the heads are 15–30-flowered, in well developed plants the cauline leaves are much more numerous than in *S. Cutleri*, and the appressed-setulose or glabrate achenes are only 2–2.6 mm. long. As far as observed by the writer *S. Cutleri* and *S. Randii*, var. *monticola* are of quite different altitudinal distribution. As pointed out in the preceding paragraph *S. Cutleri* is a truly alpine species. *S. Randii*, var. *monticola*, on the other hand, is apparently unknown on our highest summits, but occurs on the lesser peaks and slopes of northern New England. Its most elevated stations are on the summits of such mountains as Mt. Willard, New Hampshire (793 m.), Mt. Monadnock, New Hampshire (967 m.), and Mt. Willoughby, Vermont (808 m.); and it descends on the granitic coast of eastern Maine to rocks bordering the sea.

SOLIDAGO HUMILIS Pursh, Fl. 543 (1814). The plant which has long passed as *S. humilis* Pursh or *S. Purshii* Porter has a most unfortunate nomenclatorial history. The plant itself is one of the best marked of our eastern species, characterized by its racemose or thyrsoid inflorescence, with the often glutinous heads frequently on comparatively elongate pedicels (5–15 or even 25 mm. long). Its stem is exceedingly leafy, the subuniform or very gradually smaller oblanceolate or linear cauline leaves numbering, in well developed plants, 10 to 30 or more and commonly bearing small fascicles of leaves in their axils. Its obscurely ribbed oblanceolate basal leaves are 3–12 cm. long, 5–7 mm. broad. This distinct plant occurs on more or less calcareous cliffs and ledgy shores, from the Aroostook River, New Brunswick, to the Potomac, and locally westward to the sand-hills of Lake Michigan. Dr. Gray, on returning from a study of types of American Goldenrods in European herbaria, identified[1] this plant with Pursh's *S. humilis*; but an examination of Pursh's type, now preserved at the British Museum of Natural History, shows that this conclusion must have been reached through some confusion of data.

As Dr. Gray clearly states the Pursh type was "the Newfoundland plant, in herb. Banks, where Solander indicated the species."[1] A photograph of this original sheet in the Banks herbarium and notes taken by the writer show that there are three individual plants upon it. In the middle of the sheet is a specimen with seven very long leaves, all but the uppermost long-petioled, the middle one more than one third as long as the full height of the plant. The inflorescence is an interrupted more or less wand-like panicle. This specimen, which bears the data (on the reverse side of the sheet) "Newfoundland J. B.," was correctly indicated by a note on the sheet in Dr. Gray's hand as the original of *S. humilis* Pursh. The other two plants on the sheet are clearly of one collection and bear the data, "Amer. Sept. Hudson Bay, Albany Fort, 1781," and are marked by Dr. Gray: "Perhaps is the *S. stricta* Torr. & Gray, Fl. non Ait. A. Gray, 1881." These plants from Hudson Bay are, as identified by Dr. Gray, clearly *S. uliginosa* Nutt. (*S. stricta* Torr. & Gray, not Ait.); but the Newfoundland plant collected by Banks is less obviously that species and may be an uncharacteristic *S. uniligulata* (DC.) Porter. As shown by the manuscript descriptions of the Banks plants preserved at the British Museum, Solander had written a description (p. 321) to cover a Bartram plant from Florida and the Banks plant from Newfoundland. Subsequently, however, Dryander altered the description to include the Hudson Bay specimen but to exclude the Florida plant; and Pursh in his Flora (p. 543) took his description of *S. humilis* from the complex description of Solander and Dryander, citing "*Herb. Banks.* mss." From the fact that Solander, in the original manuscript description of *S. humilis,* cited (besides the subsequently discarded Florida plant) only one plant, the Banks specimen from Newfoundland, it is fairly clear that this should stand as the type of Pursh's species. Whether or not it proves on more critical examination to be *S. uniligulata* (which is probable) or *S. uliginosa,* it certainly is not the plant of our river-gorges and cliffs to which the name *S. humilis* has so long been applied.

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[1] Gray, Syn. Fl. i. pt. 2, 148 (1884).

On account of a supposed earlier *Solidago humilis* accredited to Miller, which, however, was published by Miller as *S. humilius*[1] and which is *S. canadensis* L., Porter rejected the name *S. humilis* Pursh and assigned to the plant which has been passing as Pursh's *S. humilis* the name *S. Purshii,*[2] defining his species merely by the citation of the synonym *S. humilis* Pursh. The name *S. Purshii* Porter is, therefore, strictly synonymous with *S. humilis* Pursh; and since, as above pointed out, the plant which must stand as the type of Pursh's species is *S. uniligulata* or a related species, the names *S. humilis* and *S. Purshii* are equally untenable for the plant of our northeastern river-banks and cliffs. A well known station for the plant specially under discussion is at the Great Falls of the Potomac. The plants from this station long have been and by most botanists still are considered conspecific with those from the ledges of the Aroostook, Kennebec, Winooski (or Onion) and Susquehanna Rivers; but by Professor E. L. Greene they have been separated on supposed characters of the inflorescence, involucre, and achenes as *S. racemosa.*[3] The characters upon which Professor Greene relies for the separation all fail when tested by comparison with more northern specimens; and the range assigned by him on a succeeding page ("that plant of the East Canadian coast and islands which is typical *S. humilis,* Pursh, now received under the more safe name of *S. Purshii,* Porter" [4]) suggests that his segregation of *S. racemosa* from the plant of our river-gorges and cliffs, which is known from only a single "East Canadian" station [5] and from no coastal or island stations, was accomplished without a precise understanding of the northern "*S.*

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[1] Mill Dict. ed. viii. no. 16 (1768).

[2] Porter, Bull. Torr. Bot. Cl. xxi. 311 (1894).

[3] Greene, Pittonia, iii, 160 (1897).

[4] Greene, Pittonia, iii. 162 (1897).

[5] The Gorge of the Aroostook River, less than two miles from the northern Maine border.

humilis." Nevertheless, although proposed by Professor Greene for a plant which he supposed distinct, *S. racemosa* is the first name clearly applied to the plant with racemose inflorescence which has passed as *S. humilis* or *S. Purshii*.

Solidago racemosa Greene, var. **Gillmani** (Gray), n. comb. *S. humilis*, var. *Gillmani* Gray, Proc. Am. Acad. xvii. 191 (1882). *S. Virgaurea*, var. *Gillmani* Porter, Bull. Torr. Bot. Cl. xx. 209 (1893). This splendid plant of the Great Lake region has not only the leaf-texture and -outline but the axillary fascicles, the elongate pedicels, and the involucre and achenes of *S. racemosa*, and seems to differ only in its great size and in the tendency of the lower leaves to have longer and sharper teeth.

Solidago rugosa Mill., var. **villosa** (Pursh), n. comb. *S. villosa* Pursh, Fl. ii. 537 (1814). The material in the Banks herbarium upon which Pursh based his species represents a beautifully marked extreme of *S. rugosa* in which the panicle is elongate and most of the racemes nearly equaled or exceeded by the large subtending leaves. It is the common tendency of the species in western Newfoundland, southern Labrador, and the lower St. Lawrence region, extending into northern Maine.

Solidago altissima L. Sp. 878 (1753). As stated by Dr. Gray, "the true original of the Linnaean species is the 'Virga aurea altissima serotina, panicula speciosa patula, Mart. Cent. 14, t. 14.'"[1] This plate[2] is remarkably characteristic and represents a plant which was taken by Dr. Gray as "a large form of *S. Canadensis*." In fact, Linnaeus compares it with *S. canadensis* in the following words: "Habitus *praecedenti* [*S. canadensis*] *simillimus, diversus magnitudine, tempore florendi, serraturis nervisque foliorum*," etc.,[3] thus showing a clearer conception of the two plants, *S. canadensis* and *S. altissima*, than have most subsequent authors. *S. canadensis*, as interpreted by Dr. Gray, apparently with good reason, is the small-headed plant which has subsequently been described as *S. canadensis*, var. *glabrata* Porter, Bull. Torr. Bot. Cl. xxi. 310 (1894). Dr. Porter, in describing the northern plant as var. *glabrata*, separated it from the commoner plant southward on account of its smoother stem, linear-lanceolate sharp-serrate smoothish leaves, and especially its smaller panicles and involucres; characters which in the main agree with the Linnaean description of *S. canadensis,* which was originally said to have the heads smaller than in the subentire-leaved *S. altissima* and which was characterized "foliis trinerviis subserratis."

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[1] Gray, Proc. Am. Acad. xvii. 177 (1882).

[2] Martyn, Hist. Pl. 14, t. 14, (1728).

[3] L. Sp. 878 (1753).

A detailed study of the small-headed northern plant, which was considered by Dr. Porter a variety of *S. canadensis* but which is the *S. canadensis* of the old European gardens and herbaria and very evidently of Linnaeus, and the larger-headed more southern plant, which was described by Linnaeus as *S. altissima* and has subsequently passed as a large variation of *S. canadensis* (var. *scabra* Torr. & Gray and much which has passed as var. *procera* Torr. & Gray) has convinced the writer that they are perfectly good species and that they are separated by several other characters besides those originally emphasized by Linnaeus. *S. canadensis* has the stem glabrous at least below, though often minutely pubescent above; in *S. altissima* the stem is cinereous-puberulent. In *S. canadensis* the leaves are thin, narrowly lanceolate, glabrous above, minutely pubescent on the nerves beneath, and mostly sharp-serrate; in *S. altissima* the thickish leaves are lanceolate, minutely pubescent or scabrous above, short-pilose beneath, and subentire or only slightly toothed. The involucre of *S. canadensis* is 2–2.8 mm. long, of thin greenish-straw-colored mostly attenuate bracts; that of *S. altissima* 3.2–4.5 mm. long, with more herbaceous and coarser bracts. *S. canadensis,* which abounds from Newfoundland and the lower St. Lawrence to North Dakota, extending southward throughout northern and eastern New England and along the mountains to West Virginia and Kentucky, is in the height of bloom from July to September; *S. altissima* occurs from eastern Massachusetts and Vermont to Michigan and Kansas, extending south to the Gulf of Mexico, and flowers from August to October.

Solidago altissima L., var. **procera** (Ait.), n. comb. *S. procera* Ait. Hort. Kew. iii. 211 (1789). *S. canadensis,* var. *procera* Torr. & Gray, Fl. ii. 224 (1841).

Solidago graminifolia (L.) Salisb., var. **Nuttallii** (Greene), n. comb. *Euthamia Nuttallii* Greene, Pittonia, v. 73 (1902).— *S. graminifolia* is the common glabrous or nearly glabrous plant of eastern Canada and the northern states, but it passes very frequently to the var. *Nuttallii,* which has the leaves more pubescent and the branches of the inflorescence hirtellous. As originally defined by Professor Greene the more pubescent plant was assigned a known range from

New Jersey and Pennsylvania to Virginia. Material in the Gray Herbarium shows it to extend northeastward to Nova Scotia and west to Michigan.

Solidago **polycephala**, n. nom. *Euthamia floribunda* Greene. Pittonia, v. 74 (1902), not *S. floribunda* Phil. Anal. Univ. Chil. lxxxvii. 430 (1894).— This pretty species is quickly distinguished from *S. graminifolia*, var. *Nuttallii* by its tiny involucre (3–3.5 mm. long), with very conspicuous appressed deltoid green tips to the bracts. It was originally described from southern New Jersey but the writer has examined characteristic material from adjacent Pennsylvania.

Solidago **minor** (Michx.), n. comb. *S. lanceolata*, var. *minor* Michx. Fl. ii. 116 (1803). *S. tenuifolia* Pursh, Fl. ii. 540 (1814) in part. *Euthamia minor* Greene, Pittonia, v. 78 (1902).— Distinguished from *S. tenuifolia* Pursh, which has the flat leaves 2–6 mm. wide and the campanulate involucre 2–3 mm. broad, by its almost acicular leaves (the middle cauline 1–1.5 mm. wide) and its nearly cylindric acute-based involucre only 1–1.5 mm. broad. Best developed from Virginia to Florida and Alabama, but said by Professor Greene to reach Connecticut.

Solidago (Euthamia) **Moseleyi**, n. sp., caule glabro 5–6 dm. alto fastigiatim ramoso, ramulis scabris; foliis linearibus vel lineari-lanceolatis apice attenuatis 2–3 mm. latis 1-nerviis minute punctatis, foliis ramorum minoribus, ramulorum minutis subulatis; capitulis plerumque pedicellatis, pedicellis scabris; involucro snbcylindrico 3–4 mm. longo 1.5–2 mm. lato, bracteis linearibus tenuibus valde inequalibus.— Stem glabrous, 5–6 dm. high, fastigiate-branched above the middle; branchlets scabrous: leaves linear or linear-lanceolate, taper-pointed, 2–3 mm. broad, 1-ribbed, minutely punctate; rameal leaves smaller, those of the branchlets reduced to minute subulate bracts: heads mostly on scabrous pedicels: involucre subcylindric (slender-turbinate in drying), 3–4 mm. long, 1.5–2 mm. broad; its very unequal thin bracts linear.— Ohio, Oxford Prairie, Erie Co., September 5, 1898 (*E. L. Moseley*). Resembling *S. tenuifolia* Pursh, but without the axillary fascicles of small leaves which usually characterize that species; the bracts of the branchlets much shorter; the heads less glomerulate; and the involucre much smaller and more slender, with softer bracts, that of *S. tenuifolia* being campanulate, 2–3 mm. thick, with firm oblong bracts.

Solidago **gymnospermoides** (Greene), n. comb. *Euthamia gym-*

nospermoides Greene, Pittonia, v. 75 (1902).— A well marked species of the lower Mississippi basin, differing from *S. leptocephala* Torr. & Gray in its more copious fastigiate branching; its linear-attenuate strongly glutinous leaves at most 2–3 mm. broad, instead of linear-lanceolate, merely acute, and 4–6 mm. wide; and the involucre extremely viscid.

ASTER **depauperatus** (Porter), n. comb. *A. ericoides*, var. *pusillus* Gray, Syn. Fl. i. pt. 2, 184 (1884). *A. ericoides*, var. *depauperatus* Porter, Mem. Torr. Bot. Cl. v. 323 (1894).— This delicate plant of serpentine barrens of southern Pennsylvania and adjacent West Virginia is readily separated from *A. ericoides* by its very slender stem; its tiny rameal leaves; and especially by the turbinate, not companulate nor hemispherical, involucre only 2–3 mm. broad; and by its much less rigid bracts. In richer soil westward it is represented by

Var. **parviceps** (Burgess), n. comb. *A. ericoides*, var. *parviceps* Burgess in Britton & Brown, Ill. Fl. iii. 379 (1898). This is a stouter plant with densely white-villous stems and broader leaves, but with the heads as in the typical form of *A. depauperatus* or slightly larger. It occurs on prairies or in woods of Illinois and Missouri.

ASTER LATERIFLORUS (L.) Britton, var. **bifrons** (Gray), n. comb. *A. diffusus*, var. *bifrons* Gray, Syn. Fl. i. pt. 2, 187 (1884). *A. lateriflorus*, var. *grandis* Porter, Mem. Torr. Bot. Cl. v. 324 (1894).

GNAPHALIUM POLYCEPHALUM Michx., var. **Helleri** (Britton), n. comb. *G. Helleri* Britton, Bull. Torr. Bot. Cl. xx. 280 (1893).— This seems to differ from *G. polycephalum* only in its glandular-viscid stems and to be, therefore, only of varietal value.

CIRSIUM **iowense** (Pammel), n. comb. *Cnicus iowense* Pammel, Proc. Iowa Acad. Sci. viii. 231 (1901).— *Cnicus* L. Sp. 826 (1753) is now generally accepted as a monotypic genus, its only species being the Blessed Thistle, *Cnicus benedictus* L. By a few recent American botanists our thistles with plumose pappus are united with the Old World genus *Carduus* L., which has the bristles plumeless; but the writer finds himself in agreement with DeCandolle, Bentham and Hooker, Gray, Engler, Hoffmann, and many others in keeping the two apart. The earliest designation of the thistles with plumose pappus is apparently *Cirsium* Hill. Brit. Herbal, 427 (1756).

CIRSIUM UNDULATUM (Nutt.) Spreng., var. **megacephalum** (Gray), n. comb. *Cnicus undulatus*, var. *megacephalus* Gray, Proc. Am. Acad. x. 42 (1874). *Carduus undulatus*, var. *megacephalus* Porter, Mem. Torr. Bot. Cl. v. 345 (1894).

CIRSIUM MUTICUM Michx., var. **subpinnatifidum** (Britton), n. comb. *Carduus muticus*, var. *subpinnatifidus* Britton in Britton & Brown, Ill. Fl. iii. 489 (1898).

CIRSIUM **Hillii** (Canby), n. comb. *Cnicus Hillii* Canby, Gard. & For. iv. 101 (1891). *Carduus Hillii* Porter, Mem. Torr. Bot. Cl. v. 344 (1894).

PRENANTHES ALTISSIMA L., var. **cinnamomea**, n. var., pappo cinnamomeo.— Pappus cinnamon-color; otherwise like the typical form.— Indiana to Missouri and Louisiana. Type collected in rich woods, Monteer, MISSOURI, October 5, 1905 (*Bush*, no. 3534).

GRAY HERBARIUM.

THE ANNUAL BOTANICAL SYMPOSIUM.— The fifth annual symposium will be held at Georgetown, Delaware, July 1–8, 1908. Headquarters will be Hotel Eagle, where rooms may be secured at $1.50 a day. Trips will be made to Lewes, Rehoboth, Chesapeake Bay, Indian River, etc. Those desiring to attend should inform JOSEPH CRAWFORD, 2824 Frankford Ave., Philadelphia, Pa.

JOSSELYN BOTANICAL SOCIETY.— The annual meeting of the Josselyn Botanical Society of Maine will be held at Manset, Mount Desert Island, August 4th to 8th, 1908. A reduced rate of $2.00 per day for board and lodging has been granted by the Stanley House, and reduced railroad fares will be arranged. All who propose attending should communicate at once with O. W. KNIGHT, Chairman of Committee on Arrangements, Bangor, Maine.

LEMNA MINOR and SPARGANIUM EURYCARPUM IN RIMOUSKI COUNTY, QUEBEC.— For several summers Professor J. F. Collins and the writer have visited Bic and the adjacent towns of Rimouski County, Quebec, on account of the great development in that region of bold limestone headlands and ridges, upon which are found an extensive high-northern flora (see RHODORA, ix. 158–172). Bordering the harbor of Bic is a salt marsh, the brackish borders of which likewise support a pronouncedly northern flora: *Catabrosa aquatica* (L.) Beauv., *Poa eminens* J. S. Presl, *Scirpus rufus* (Huds.) Schrad., *Carex norvegica* Willd., *C. glareosa* Wahlenb., *Rumex occidentalis* Watson, etc. In

July last, it was, therefore, a great surprise to find a small slightly brackish pool back of the marsh closely covered with *Lemna minor* L., while near by were luxuriant plants of *Sparganium eurycarpum* Engelm.; two species which are very typical of the coastal region from Nova Scotia and eastern Massachusetts southward and of the Mississippi Basin. These plants which are very local at Bic are not definitely recorded in Macoun's Catalogue from the Province of Quebec, though credited to the vicinity of Ottawa. The nearest stations for the *Lemna* seem to be at Petitcodiac, New Brunswick, about 250 miles to the southeast, and at the head of Lake Champlain, about 330 miles to the southwest. The most northerly stations previously known to the writer for *Sparganium eurycarpum* are at Pictou, Nova Scotia, about 350 miles to the southeast, at Oldtown, Maine, 200 miles or more nearly due south, and on Lake Champlain.— M. L. Fernald, Gray Herbarium.

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